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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,911	07/26/2004	Carsten Faltum	P69949US0	6100
136	7590	07/13/2005	EXAMINER	
JACOBSON HOLMAN PLLC 400 SEVENTH STREET N.W. SUITE 600 WASHINGTON, DC 20004			FRANK, RODNEY T	
			ART UNIT	PAPER NUMBER
			2856	

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/501,911

Applicant(s)

FALTUM ET AL.

Examiner

Rodney T. Frank

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 09/27/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Objections

Claim 11 is objected to because of the following informalities: in the third line of the claim, there is a measurement of 5 xm where x is currently a box. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 11 recites the limitation "said second substrate" in reference to claim 1.

There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting

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directly or indirectly from an international application filed before November 29, 2000.

Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-7, 12, 13, 15, 17, 20, 24, 25, 27, and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by de Charmoy et al (U.S. Patent Number 6,575,020; hereinafter referred to as de Charmoy)

The applied reference has a common inventor and assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

De Charmony discloses that the present invention relates to integrated micro-cantilevers, micro-bridges or micro-membranes in micro-liquid handling systems. Such micro-liquid handling systems provide novel detection mechanisms for monitoring the physical, chemical and biological properties of fluids in such systems. The present invention further relates to micro-cantilever, micro-bridge or micro-membrane type sensors having integrated readout. Such constructions allow laminated flows of different liquids to flow in a channel without mixing, which opens up for new type of experiments and which reduces noise related to the liquid movement. The present invention even further relates to sensors having adjacent or very closely spaced micro-

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cantilevers, micro-bridges or micro-membranes which can be exposed to different chemical environments at the same time (Please see the abstract).

In reference to claim 1, de Charmony discloses in column 10 beginning with line 33 and through column 11 ending with line 30, and shows in figure 1, a sensor for detecting a substance in a liquid, said sensor comprising a primary substrate and a sensor unit (3) connected to said primary substrate, said primary substrate being shaped as a pillar, said sensor comprising detecting means for detecting a change of stress or mass generated on a surface area of the sensor unit, and an electric communication line (4) for applying a voltage over said detection means, at least one of said wires being integrated in said pillar shaped primary substrate.

In reference to claim 2, it is disclosed that de Charmoy utilizes a cantilever connected to the pillar shaped substrate and the use of a Wheatstone bridge is disclosed in, for example, in column 6 in lines 26 through 36.

In reference to claim 3, column 1 lines 51 through 55 describe the cantilever having a thickness less than its length and width and that it's formed using micromachining from the substrate.

In reference to claim 4, de Charmoy discloses the use of a piezoresistive sensor in column 4, lines 51 through 56.

In reference to claim 5, the use of a laser is disclosed in column 4 lines 56 through 58.

In reference to claim 6, since the cantilever is shown in figure 1 to be parallel to the substrate, it would be at an angle of 180° with respect to the substrate, which would

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fall within the specified range of the current claimed invention. Further, the position of the cantilever with respect to the substrate is shown in figure 1.

In reference to claim 7, the electronic feed-throughs (4) shown in figure 1 pass through the primary substrate in a line at an angle of about 90° to the uppermost surface.

In reference to claim 12, column 10, line 36 discloses the substrate is made from silicon.

In reference to claim 13, the sensor unit is disclosed to be made from the same material as the substrate and actually machined from the original substrate itself.

In reference to claim 15, the cantilever is shown in figure 1 to protrude from the substrate and it is in a rectangular shape.

In reference to claim 17, the upper surface of the substrate is shown to be parallel to the uppermost surface of the cantilever.

In reference to claim 20, figure 2 shows the primary substrate connected to 2 identically shaped rectangular cantilevers, while figure 11 shows arrangements a) and b) having three identically shaped cantilevers from the primary substrate.

In reference to claims 24 and 25, beginning with column 5 with line 63 and concluding in column 6 with line 21, the reference discloses the use of a interaction chamber with an inlet and an outlet, thus the use of a chamber as in claim 24, and a fluid channel as in claim 25, would also be disclosed in view of the sensor arrangement disclosed by the de Charmony reference.

In reference to claims 27 and 28, figure 1 shows two sensor units, with one being the detector system (3) and one being a reference electrode (8). Further, the use of a reference measurement is disclosed in column 17, lines 17 through 42.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8-10, 16, and 18, 19, 21-23, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Charmoy et al.

With regard to claims 8 and 18, though the exact placement of the wires with respect to the substrate is not disclosed, there is no disclosed advantage or unexpected result stemming from the placement of the wires providing voltage to the system and therefore, this claim is seen as a mere design choice that would be well within the preview of one of ordinary skill in the art at the time of the invention.

With regard to claim 9, though not specifically disclosed, as best can be determined from the figures, the wires pass through the substrate in a straight line.

With regard to claim 10, the piezoresistor design parameters and characteristics disclosed are not explicitly disclosed in the reference. However, the examiner takes official notice that the design parameters and characteristics of the piezoresistive element currently claimed are well known and established in the art and one of ordinary skill would be able to construct such a piezoresistive element.

With respect to claim 16, the bridge/cantilever design parameters and characteristics disclosed are not explicitly disclosed in the reference. However, the examiner takes official notice that the design parameters and characteristics of the bridge/cantilever currently claimed are well known and established in the art and one of ordinary skill would be able to construct such a bridge/cantilever.

With respect to claims 19 through 22, while the circuit connected to provide the voltage is not specifically disclosed, this limitation is deemed obvious since such a circuit is needed in order for the device to work as intended. Furthermore, the exact implementation and/or design of said circuit, since not disclosed as advantageous in one form or another, are also deemed as obvious to one of ordinary skill in the art in order to operate the device as intended.

With respect to claim 23, the sensor wires being disposed in either a primary or secondary substrate position would be considered as obvious to one of ordinary skill in the art since the position of the wires does not alter its intended operation.

With respect to claim 26, though the exact use of a detection ligand is not disclosed, de Charmony discloses the use of the sensor arrangement for gene detection and antigen-antibody reaction. With this, it is disclosed in column 18 in lines 27 through 51 that the use of binding chemistry is utilized and therefore the use of a substance (i.e. a ligand) to form a specific binding pair, is deemed as obvious to one of ordinary skill in the art in order for such a reaction to occur.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over de Charmony et al. as applied to claims 1-10 and 12-28 above, and further in view of Holm-

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Kennedy et al. (U.S. Patent Number 5,101,669; hereinafter referred to as Holm-Kennedy).

Holm-Kennedy discloses a multibeam structure measures displacement of one or more response elements to detect multiple components of applied force. The flexible beams are each coupled to a response element, which may be displaced by a force arising from linear acceleration, angular acceleration, fluid flow, electric/magnetic/gravitational fields, and other sources. The displacement of the response element is detected with a variety of sensing methods including capacitive and piezoresistive sensing (Please see the abstract). The motivation to combine the teachings of de Charmony with those of Holm-Kennedy is due to the fact that both are in the same field of endeavor and would be seen as similar, if not equivalent measuring systems.

With this in mind, though the de Charmony reference does not disclose the use of a capacitor, specifically, figure 3a of Holm-Kennedy discloses the use of a capacitor with a cantilever detector system. With this disclosure, the use of a capacitive means of measuring stress on the flexible cantilever element would be deemed as obvious to one of ordinary skill in the art as a well known method of measuring stress on the cantilever.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney T. Frank whose telephone number is (571) 272-2193. The examiner can normally be reached on M-F 9-5:30 p.m. EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron E. Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RTF
July 10, 2005


DANIEL S. LARKIN
PRIMARY EXAMINER